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AGILENT TECHNOLOGIES, INC.
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EXAMINER

CROW, ROBERT THOMAS

ART UNIT	PAPER NUMBER
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1634

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/797,764	THOMPSON ET AL.	
	Examiner	Art Unit	
	Robert T. Crow	1634	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 February 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) 16 and 17 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-15 and 18-25 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

FINAL ACTION

Status of the Claims

1. This action is in response to papers filed 28 February 2008 in which claims 1-14 were amended, no claims were canceled, and new claims 18-25 were added. All of the amendments have been thoroughly reviewed and entered.

The previous rejections under 35 U.S.C. 102(a, b, and e) and 35 U.S.C. 103(a) not reiterated below are withdrawn in view of the amendments. Applicant's arguments have been thoroughly reviewed and are addressed following the rejections necessitated by the amendments.

Claims 1-15 and 18-25 are under prosecution.

Interview Summary

2. The examiner mailed an Interview Summary on 6 March 2008. Applicant is reminded that for the response to this Office Action to be complete, a summary of the substance of the interview of 25 February 2008 must be included.

Information Disclosure Statement

3. The Information Disclosure Statements filed 24 September 2007 are acknowledged.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claims 1-15 and 18-25 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. **This is a new matter rejection.** The claim(s) contains subject matter

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which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Independent claim 1, upon which claims 2-15 and 18-25 ultimately depend, recites "at least one gasket" in line 5 of the claim, "at least one spacer" in line 7 of the claim,. A review of the specification yields no recitation of either "at least one" or "a plurality of" spacers or gaskets, or a recitation of "spacers." While Figures 4A shows two gaskets (labeled 127) and two spacers (labeled 129), and Figure 5B shows two gaskets 127 and four spacers 129, the specification does not show more than two gasket or four spacers. In addition, it is noted that while Applicant has provided paragraph numbers from the specification to support the amendments, the instant specification does not contain numbered paragraphs; thus, it is unclear exactly where the alleged support for the amendments is contained in the specification. Thus, the instantly claimed "at least one spacer" and "at least one gasket" encompasses a plurality of gaskets and spacers that exceeds the number actually taught by the instant specification. Therefore, the instantly claimed "at least one spacer" and "at least one gasket" constitute new matter.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the

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examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. Claims 1-3, 5-6, 9, 13, and 18-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dahm et al (U.S. Patent No. 6,399,394, issued 4 June 2002) in view of Lyman et al (U.S. Patent No. 6,555,361 B1, issued 29 April 2003).

Regarding claim 1, Dahm et al teach an apparatus for holding a slide. In a single exemplary embodiment, Dahm et al teach Figure 8, which shows cover member 30 (column 8, line 15- column 10, line 65), which is a substrate comprising front side 32 which is opposite substrate 10, which is a slide (column 13, lines 33-40). The backside of substrate 30 further has a support ridge in the form of the thicker middle part of substrate 30 containing bores 122 and 120 (column 8, line 15- column 10, line 65). At least one gasket in the form of gasket 60 is interposed between slide 10 and substrate 30, and at least one spacer in the form of studs 50 (Figure 8). The gasket, substrate and slide form chambers for hybridization (column 5, lines 15-30).

While Dahm et al teach the use of plastic substrates (column 13, lines 50-67), and thermoplastic gaskets (column 12, lines 50-65), Dahm et al do not explicitly teach thermoplastic substrates or that the height of the spacer is less than the height of the gasket.

However, Lyman et al teach an array hybridization apparatus (Title) comprising a thermoplastic substrate, wherein thermoplastics have the added advantage of providing resistance to the full range of conditions to which the apparatus is exposed (i.e., during hybridization procedures; column 4, lines 1-10). The apparatus further comprises a spacer in the form of raised ring 26, which is slightly shorter than the thickness of the o-ring gasket (Figure 3 and column 3, lines 10-60). Thus, the o-ring gasket, the base portion substrate, the top portion slide and the raised ring define the chamber when the components are held together and the substrate is held flat. Lyman et al also teach the arrangement has the added

advantage of allowing sealing of the device (Abstract). Thus, Lyman et al teach the known techniques of using thermoplastic substrates and spacer with heights that are less than the height of the gasket

It would therefore have been obvious to a person of ordinary skill in the art at the time the claimed invention was made to have modified the apparatus as taught by Dahm et al with the thermoplastic substrates and gasket/ spacer heights of Lyman et al with a reasonable expectation of success. The ordinary artisan would have been motivated to make the modification because said modification would have resulted in an apparatus having the added advantage of providing resistance to the full range of conditions to which the apparatus is exposed as well as allowing sealing of the device as explicitly taught by Lyman et al (column 4, lines 1-10 and Abstract). In addition, it would have been obvious to the ordinary artisan that the known technique of using the thermoplastic substrates and gasket/ spacer heights of Lyman et al could have been applied to the apparatus of Dahm et al with predictable results because the thermoplastic substrates and gasket/ spacer heights of Lyman et al predictably result in sealed devices stable to hybridization assay conditions.

Regarding claim 2, the apparatus of claim 1 is discussed above. Dahm et al teach the at least one gasket comprises a substantially deformable material; namely, the gasket is a thermoplastic gasket (column 12, lines 50-65). Page 7 of the instant specification states that "substantially deformable" has a similar meaning as "deformable," and page 6 of the instant specification recites an embodiment wherein deformable gaskets are thermoplastic.

Regarding claim 3, the apparatus of claim 1 is discussed above. Spacer 50 is part of the substrate 30 (Figure 8), which is made of the thermoplastic polypropylene in accordance with the teachings of Lyman et al (column 4, lines 1-10). Polypropylene is substantially non-deformable. Thus, modification of the apparatus of Dahm et al with the teachings of the thermoplastic materials of Lyman et al results in a spacer made of a substantially non-deformable material.

Regarding claim 5, the apparatus of claim 1 is discussed above. Dahm et al also teach the at least one gasket is attached to the substrate; namely, the gasket is attached, via bonding, to the cover of Dahm et al, which is the substrate of the instant claims (column 5, lines 15-50).

Regarding claim 6, the apparatus of claim 1 is discussed above. Dahm et al further teach the at least one gasket comprises a portion of the substrate; namely, the gasket is permanently attached, via bonding, to the cover of Dahm et al, which is the substrate of the instant claims (column 5, lines 15-50). Because the binding is permanent, and because the gasket is thermoplastic (column 12, lines 50-65), the gasket comprises a portion of the thermoplastic substrate.

Regarding claim 9, the apparatus of claim 1 is discussed above. Dahm et al further teach the spacer is attached to the substrate; namely, substrate 30 carries the spacers 50 projecting from the front side (column 8, lines 25-30), wherein "carrying" is interpreted as "attached." In addition, it is noted that while column 8, lines 25-30 refers specifically to Figures 4-6, it would be obvious to the person of ordinary skill in the art at that the spacers of Figure 8 could also be "carried" (i.e., attached) to the front side of substrate 30 because Dahm et al teach the attachment of the spacers to the substrate.

Regarding claim 13, the apparatus of claim 1 is discussed above. Dahm et al teach all of the components of the apparatus may be made of the same material (i.e., metal). Spacer 50 is made of the thermoplastic polypropylene in accordance with the teachings of Lyman et al (column 4, lines 1-10). Polypropylene is substantially non-deformable. Thus, modification of the apparatus of Dahm et al with the teachings of the thermoplastic materials of Lyman et al results in a spacer made of a plastic.

Regarding claim 18, the apparatus of claim 1 is discussed above. Dahm et al also teach a holder in the form of screw 100 (Figure 8) which has notches, in the form of functionally equivalent threads, to hold the slide and substrate in registered alignment when the hybridization chamber is defined because the screw hold the pieces together to form the chamber.

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Regarding claim 19, the apparatus of claim 18 is discussed above. Dahm et al also teach the holder holds the substrate substantially flat when the hybridization chamber is defined; namely, the cover member (i.e., substrate) is held flat when the apparatus is assembled (column 5, lines 15-50).

Regarding claims 20-21, the apparatus of claims 1 and 18 is discussed above. Dahm et al also teach the holder further comprises a cover in the form of plate 80, which enables pressure to be applied to said slide for the purpose of defining the hybridization chamber because the cover 80 allows holder screws 100 to urge (i.e., pressure) the components of the apparatus together and form the array hybridization chamber (column 9, lines 45-67). In addition, it is noted that while column 9, lines 45-67 refers specifically to Figures 4-6, it would be obvious to the person of ordinary skill in the art at that the holder screws of Figure 8 could also be used to apply pressure to the apparatus because Dahm et al teach the screws are used with Figure 8.

Regarding claim 22, the apparatus of claim 6 is discussed above. Dahm et al further teach the at least one gasket is integral to the substrate; namely, the gasket is permanently attached, via bonding, to the cover of Dahm et al, which is the substrate of the instant claims (column 5, lines 15-50). Because the binding is permanent, the gasket is integrated with (i.e., integral to) the substrate.

Regarding claim 23, the courts have stated:

“[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process.” *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985). See MPEP§ 2113.

While neither Dahm et al nor Lyman et al specifically teach injection molding of the substrate, these limitations are part of the process of making the substrate rather than structural limitations of the substrate. Because the prior art teaches the structural elements of the claim, the claim is obvious over the prior art.

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9. Claims 4 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dahm et al (U.S. Patent No. 6,399,394, issued 4 June 2002) in view of Lyman et al (U.S. Patent No. 6,555,361 B1, issued 29 April 2003) as applied to claim 1 above, and further in view of Dickinson et al (U.S. Patent Application Publication No. US 2002/0102578 A1, published 1 August 2002).

Regarding claims 4 and 7, the apparatus of claim 1 is discussed above in Section 8.

While Dahm et al also teach the at least one gasket is attached to the substrate; namely, the gasket is attached, via bonding, to the cover of Dahm et al, which is the substrate of the instant claims (i.e., claim 7; column 5, lines 15-50), neither Dahm et al nor Lyman et al teach the gasket is attached to said slide.

However, Dickinson et al teach an array hybridization apparatus for holding a slide, wherein a sealant in the form of gasket 94 (paragraph 0148). The sealant gasket is fixed to a lid (i.e., attached to a slide; paragraph 0148), and is also attached to the substrate by an adhesive (paragraph 0074). Dickinson et al also teach the attachment of the gasket to the slide has the added advantage of providing an airtight seal in the device (paragraph 0148), which would prevent the introduction of contaminants during use of the device. Thus, Dickinson et al teach the known technique of attaching a gasket to a slide.

It would therefore have been obvious to a person of ordinary skill in the art at the time the claimed invention was made to have modified the apparatus comprising a slide, a substrate, and a gasket (i.e., claim 4) and wherein the substrate is attached to the gasket (i.e., claim 7) as taught by Dahm et al in view of Lyman et al so that the gasket is attached to the slide as taught by Dickinson et al to arrive at instantly claimed apparatus with a reasonable expectation of success. The modification would result in a slide attached to a gasket (i.e., claim 4) that is also attached to the substrate (i.e., claim 7). The ordinary artisan would have been motivated to make the modification because said modification would have resulted in an apparatus having the added advantage of preventing the introduction of contaminants during use of the device as a result of providing an airtight seal in the device as explicitly taught by Dickinson et al (paragraph 0148). In addition, it would have been obvious to the ordinary artisan that the known technique attaching a gasket to a slide as taught by Dickinson et al could have been applied to the

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apparatus of Dahm et al in view of Lyman et al with predictable results because the known technique attaching a gasket to a slide as taught by Dickinson et predictably results in a reliably sealed device.

10. Claims 8 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dahm et al (U.S. Patent No. 6,399,394, issued 4 June 2002) in view of Lyman et al (U.S. Patent No. 6,555,361 B1, issued 29 April 2003) as applied to claim 1 above, and further in view of Gallagher et al (U. S. Patent Application Publication No. US 2003/0064507 A1, published 3 April 2003).

Regarding claims 8 and 12, the apparatus of claim 1 is discussed above in Section 8.

Dahm et al also teach the substrate is attached to the spacer; namely, substrate 30 carries the spacers 50 projecting from the front side (column 8, lines 25-30), wherein "carrying" is interpreted as "attached." In addition, it is noted that while column 8, lines 25-30 refers specifically to Figures 4-6, it would be obvious to the person of ordinary skill in the art at that the spacers of Figure 8 could also be "carried" (i.e., attached) to the front side of substrate 30 because Dahm et al teach the attachment of the spacers to the substrate (i.e., claim 12).

Neither Dahm et al nor Lyman et al teach the spacer is attached to the slide.

However, Gallagher et al teach a microfluidic device comprising substrate having a biological array (Figure 1) comprising a spacer that in part defines the volume of a microfluidic chamber, wherein the spacer is attached to the substrate and a membrane, which are functionally equivalent to the slide and substrate of the instant claims. Thus, Gallagher et al teach the known technique of having the spacer attached to the slide.

It would therefore have been obvious to a person of ordinary skill in the art at the time the claimed invention was made to have modified the apparatus comprising a slide, a substrate, and a spacer (i.e., claim 8) and wherein the substrate is attached to the spacer (i.e., claim 12) as taught by Dahm et al in view of Lyman et al so that the spacer is attached to the functional equivalent of a slide as taught by Gallagher et al to arrive at instantly claimed apparatus with a reasonable expectation of success. The

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modification would result in a slide attached to a spacer (i.e., claim 8) that is also attached to the substrate (i.e., claim 12). It would have been obvious to the ordinary artisan that the known technique attaching a spacer to a functional equivalent of a slide as taught by Gallagher et al could have been applied to the apparatus of Dahm et al in view of Lyman et al with predictable results because the known technique of attaching a spacer to the functional equivalent of a slide as taught by Gallagher et al predictably results in a proper spacing and support of a microfluidic chamber between the functional equivalents of a slide and a spacer.

11. Claims 10-11 and 24-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dahm et al (U.S. Patent No. 6,399,394, issued 4 June 2002) in view of Lyman et al (U.S. Patent No. 6,555,361 B1, issued 29 April 2003) as applied to claim 1 above, and further in view of Frye et al (U. S. Patent No. 6,272,939 B1, issued 14 August 2001).

Regarding claims 10-11, the apparatus of claim 1 is discussed above in Section 8.

Neither Dahm et al nor Lyman et al teach a plurality support ridges extending along the length of the length (i.e., claim 10) or the width (i.e., claim 10) of the thermoplastic backing.

However, Frye et al teach a plurality of support ridges on the bottom of a substrate acting as a backing for an apparatus having a chamber (Abstract); namely, Figure 1 shows an apparatus having a substrate in the form of base plate 150 which has a plurality of support ridges in the form of four feet 157 placed at each of the corners of the substrate (Figures 1 and 16). Because there are four feet at the four corners of the substrate, the feet are a plurality of ridges, wherein the plurality of ridges extends along the entire length (i.e., both long edges; claim 10) and the entire width (i.e., both short edges; claim 11). The ridges (i.e., feet) have the added advantage of allowing the apparatus to be stably supported on a surface such as a table (column 11, lines 5-20). Thus, Frye et al teach the known technique of providing a plurality support ridges extending along the length of the length (i.e., claim 11) or the width (i.e., claim 12) of the thermoplastic backing.

It would therefore have been obvious to a person of ordinary skill in the art at the time the claimed invention was made to have modified the apparatus as taught by Dahm et al in view of Lyman et al so that the bottom substrate has four feet in the corners of the bottom of the thermoplastic substrate as taught by Frye et al to arrive at instantly claimed apparatus with a reasonable expectation of success. Because there are four feet at the four corners of the substrate, the feet are a plurality of ridges, wherein the plurality of ridges extends along the entire length (i.e., both long edges; claim 10) and the entire width (i.e., both short edges; claim 11). The ordinary artisan would have been motivated to make the modification because said modification would have resulted in an apparatus having the added advantage allowing the apparatus to be stably supported on a surface such as a table as explicitly taught by Frye et al (column 11, lines 5-20). In addition, it would have been obvious to the ordinary artisan that the known technique of having support ridges (i.e., feet) on the bottom of the substrate as taught by Frye et al could have been applied to the apparatus of Dahm et al in view of Lyman et al with predictable results because the known technique of having support ridges (i.e., feet) on the bottom of the substrate as taught by Frye predictably results in a device that is easily used on a bench top.

Regarding claims 24-25, the apparatus of claims 10-11 is discussed above.

As noted above, the courts have stated that if the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process. While neither Dahm et al, Lyman et al, nor Frye et al specifically teach injection molding of the substrate, these limitations are part of the process of making the substrate rather than structural limitations of the substrate. Because the prior art teaches the structural elements of the claim, the claim is obvious over the prior art.

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12. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Dahm et al (U.S. Patent No. 6,399,394, issued 4 June 2002) in view of Lyman et al (U.S. Patent No. 6,555,361 B1, issued 29 April 2003) as applied to claim 1 above, and further in view of Wilding et al (U.S. Patent No. 5,587,128, issued 24 December 1996).

Regarding claim 14, the apparatus of claim 1 is discussed above in Section 8.

Neither Dahm et al nor Lyman et al teach the height of the spacer is between 25 to 500 microns in height.

However, Wilding et al teach an array hybridization apparatus comprising a chamber having a height (i.e., depth) of between 25 and 1000 microns; namely, 300 microns (column 4, lines 36-60). Making a chamber having a height of 300 microns would require a spacer height of less than 300 microns. Wilding et al further teach a height of 300 microns has the added advantage of permitting efficient heat transfer to the contents of the chamber during assays (i.e., amplification; column 4, lines 36-60). Thus, Wilding et al teach the known technique of having a hybridization chamber that has a height of 300 microns, thus requiring a spacer of no more than 300 microns.

It would therefore have been obvious to a person of ordinary skill in the art at the time the claimed invention was made to have modified the apparatus comprising a chamber as taught by Dahm et al in view of Lyman et al so that the chamber is 300 microns in height as taught by Wilding et al to arrive at the instantly claimed apparatus with a reasonable expectation of success. The modification would result in a spacer having heights of 300 microns so that the chamber has a height of 300 microns. The ordinary artisan would have been motivated to make such a modification because said modification would have resulted in an apparatus having the added advantage of permitting efficient heat transfer to the contents of the chamber during assays as explicitly taught by Wilding et al (column 4, lines 36-60). In addition, it would have been obvious to the ordinary artisan that the known technique of having a 300 micron hybridization chamber as taught by Wilding et al could have been applied to the spacer height of the apparatus of Dahm et al in view of Lyman et al with predictable results because the known technique

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of having a 300 micron hybridization chamber as taught by Wilding et al predictably results in a device having a hybridization chamber with dimension known to be useful in hybridization assays.

13. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Dahm et al (U.S. Patent No. 6,399,394, issued 4 June 2002) in view of Lyman et al (U.S. Patent No. 6,555,361 B1, issued 29 April 2003) in view of Frye et al (U. S. Patent No. 6,272,939 B1, issued 14 August 2001) as applied to claim 11 above, and furthering view of Wilding et al (U.S. Patent No. 5,587,128, issued 24 December 1996).

Regarding claim 15, the apparatus of claim 11 is discussed above in Section 11.

Neither Dahm et al, Lyman et al, nor Frye et al teach the height of the chamber is between 25 to 1000 microns in height.

However, Wilding et al teach an array hybridization apparatus comprising a chamber having a height (i.e., depth) of between 25 and 1000 microns; namely, 300 microns (column 4, lines 36-60). Wilding et al further teach a height of 300 microns has the added advantage of permitting efficient heat transfer to the contents of the chamber during assays (i.e., amplification; column 4, lines 36-60). Thus, Wilding et al teach the known technique of having a hybridization chamber that has a height of 300 microns.

It would therefore have been obvious to a person of ordinary skill in the art at the time the claimed invention was made to have modified the apparatus comprising a chamber as taught by Dahm et al in view of Lyman et al so that the chamber is 300 micron in height as taught by Wilding et al to arrive at the instantly claimed apparatus with a reasonable expectation of success. The ordinary artisan would have been motivated to make such a modification because said modification would have resulted in an apparatus having the added advantage of permitting efficient heat transfer to the contents of the chamber during assays as explicitly taught by Wilding et al (column 4, lines 36-60). In addition, it would have been obvious to the ordinary artisan that the known technique of having a 300 micron hybridization chamber as taught by Wilding et al could have been applied to the apparatus of Dahm et al in view of Lyman et al and Frye et al with predictable results because the known technique of having a 300 micron hybridization

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chamber as taught by Wilding et al predictably results in a device having a hybridization chamber with dimension known to be useful in hybridization assays.

14. Claim 23 is rejected under 35 U.S.C. 103(a) as being unpatentable over Dahm et al (U.S. Patent No. 6,399,394, issued 4 June 2002) in view of Lyman et al (U.S. Patent No. 6,555,361 B1, issued 29 April 2003) as applied to claims 1, 6, and 22 above, and further in view of Mogard et al (U.S. Patent No. 6,216,905 B1, issued 17 April 2001).

It is noted that while claim 23 has been broadly rejected under 35 U.S.C 103(a) as described above in Section 8, the claim is also obvious using the alternative interpretation outlined below.

Regarding claim 23, the apparatus of claims 1, 6, and 22 is discussed above in Section 8.

While modification of the apparatus of Dahm et al in view of Lyman et al results in a thermoplastic substrate as described above in Section 8, neither Dahm et al nor Lyman et al teach the substrate is injection molded.

However, Mogard et al teach thermoplastic materials having fully integrated structures formed by injection molding have the added advantage of being a simple and economical form of production (column 8, lines 1-15). Thus, Mogard et al teach the known technique of using injection molding to form thermoplastic structures.

It would therefore have been obvious to a person of ordinary skill in the art at the time the claimed invention was made to have modified the apparatus comprising a thermoplastic substrate as taught by Dahm et al in view of Lyman et al so that the substrate is injection molded as taught by Mogard et al to arrive at the instantly claimed apparatus with a reasonable expectation of success. The ordinary artisan would have been motivated to make such a modification because said modification would have resulted in an apparatus having the added advantage of permitting simple and economical production of the substrate as explicitly taught by Mogard et al (column 8, lines 1-15). In addition, it would have been obvious to the ordinary artisan that the known technique of injection molding thermoplastics as taught

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by Mogard et al could have been applied to the thermoplastics of the apparatus of Dahm et al in view of Lyman et al and Frye et al with predictable results because the known technique of injection molding thermoplastics as taught by Mogard et al predictably results in a reliable method of producing the thermoplastic components.

15. Claims 24-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dahm et al (U.S. Patent No. 6,399,394, issued 4 June 2002) in view of Lyman et al (U.S. Patent No. 6,555,361 B1, issued 29 April 2003) in view of Frye et al (U. S. Patent No. 6,272,939 B1, issued 14 August 2001) as applied to claims 10 and 11 above, and further in view of Mogard et al (U.S. Patent No. 6,216,905 B1, issued 17 April 2001).

It is noted that while claims 24-25 have been broadly rejected under 35 U.S.C 103(a) as described above in Section 11, the claims are also obvious using the alternative interpretation outlined below.

Regarding claims 24-25, the apparatus of claims 10-11 is discussed above in Section 11.

While modification of the apparatus of Dahm et al in view of Lyman et al and Frye et al results in a thermoplastic substrate having support ridges as described above in Sections 8 and 11, neither Dahm et al nor Lyman et al teach the support ridges are injection molded.

However, Mogard et al teach thermoplastic materials having fully integrated structures formed by injection molding have the added advantage of being a simple and economical form of production (column 8, lines 1-15). Thus, Mogard et al teach the known technique of using injection molding to form thermoplastic structures.

It would therefore have been obvious to a person of ordinary skill in the art at the time the claimed invention was made to have modified the apparatus comprising a thermoplastic substrate having support ridges as taught by Dahm et al in view of Lyman et al so that the substrate and support ridges are fully integrated and made by injection molding as taught by Mogard et al to arrive at the instantly claimed apparatus with a reasonable expectation of success. The ordinary artisan would have

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been motivated to make such a modification because said modification would have resulted in an apparatus having the added advantage of permitting simple and economical production of the fully integrated substrate as explicitly taught by Mogard et al (column 8, lines 1-15). In addition, it would have been obvious to the ordinary artisan that the known technique of injection molding fully integrated thermoplastic devices as taught by Mogard et al could have been applied to the thermoplastics of the apparatus of Dahm et al in view of Lyman et al and Frye et al with predictable results because the known technique of injection molding fully integrating thermoplastic devices as taught by Mogard et al predictably results in a reliable method of producing the thermoplastic components.

Response to Arguments

16. Applicant's arguments filed 9 August 2007 (i.e., the "Remarks") have been fully considered but they are not persuasive for the reason(s) listed below.

A. Applicant's arguments on pages 6-11 of the Remarks concerning the previous rejections of the claims as anticipated by Dickinson et al and Lyman et al have been considered but are moot in view of the new ground(s) of rejection necessitated by the amendments.

B. Applicant argues on page 12 of the Remarks that structure 30 of Figure 8 of Dahm et al does not resemble a support ridge as claimed by Applicants because the support ridge of Dahm et al has additional features which cannot be a part of the claimed support ridges.

However, claim 1 recites no structural limitations of the claimed support ridge, other than it is on the backside of the substrate, which is taught by Dahm et al as detailed above in Section 8. In addition, a review of the specification yields no limiting definition of any structural requirements of the claimed support ridge. Further, any additional components of the claimed support ridge are encompassed by the open claim language "comprising" found in the instant claims. Thus, the support ridge **as claimed** has been given the broadest reasonable interpretation consistent with the teachings of the specification

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regarding a "support ridge" (*In re Hyatt*, 211 F.3d1367, 1372, 54 USPQ2d 1664, 1667 (Fed. Cir. 2000) (see MPEP 2111 [R-1])).

C. Applicant's remaining arguments have been considered but are moot in view of the new ground(s) of rejection necessitated by the amendments.

Conclusion

17. No claim is allowed.

18. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

19. A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

20. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Robert T. Crow whose telephone number is (571)272-1113. The examiner can normally be reached on Monday through Friday from 8:00 am to 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ram Shukla can be reached on (571) 272-0735. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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/Robert T. Crow/
Examiner, Art Unit 1634

Robert T. Crow
Examiner
Art Unit 1634

/Diana B. Johannsen/
Primary Examiner, Art Unit 1634